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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/075,754

02/14/2002

Anthony Petrovich

DR-338J

3391

7590

05/25/2004

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EXAMINER

DEB, ANJAN K

ART UNIT

PAPER NUMBER

2858

DATE MAILED: 05/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

AY

Office Action Summary	Application No.	Applicant(s)	
	10/075,754	PETROVICH ET AL.	
	Examiner	Art Unit	
	Anjan K Deb	2858	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. In response to applicants' arguments that prior art lacks processing circuit responsive to the output signal of the sensor determining resonant frequency changes of the sensor due to mass changes are detected and processed to measure mass loading, the prior art Duncan (US 6,041,642) cited in this office action discloses this feature.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-4, 7-8, 10-12, 15-18, 20-23, 27-32 are rejected under 35 U.S.C. 102(b) as being anticipated by Duncan (US 6,041,642).

Re claims 1, 17-18, 20-21, 31-32, Duncan discloses sensor readout circuit (Fig. 1) which provides frequency signal output (Fig. 3), the readout circuit comprising phase detector circuit 11 responsive to an output signal from a sensor 10 and an input signal to the sensor and configured to detect the phase difference θ_d between the input signal V_o and the output signal V_{in} , and a drive circuit 13,14 responsive to the phase detector circuit and configured to maintain a fixed phase difference between the input signal and the output signal, and a processing circuit 34 (Fig. 2) responsive to the output signal and configured to detect resonant frequency changes (column

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5 lines 24-35) of the sensor due to mass changes (oscillating mass) (column 1 lines 25-27, column 4 lines 15-26) to measure mass loading.

Re claim 2, Duncan discloses phase difference between input signal and output signal is maintained at zero degree by the drive circuit (column 3 lines 35-54).

Re claims 3-4, 11-12, 22-23 Duncan discloses phase difference between input signal and output signal is maintained at 90 or 180 degree ($\pi/2$ or π) by the drive circuit (column 3 lines 49-54).

Re claims 7,27 Duncan discloses phase delay adjustment circuit for adjusting phase difference (column 3 lines 43-45).

Re claims 8,28 Duncan discloses output signal is a sinusoidal voltage at a predetermined frequency (Fig. 3).

Re claims 10,29 Duncan discloses a voltage step module configured to offset the input voltage by a predetermined amount to offset the frequency and measure the corresponding phase detector circuit output change (column 5 lines 36-40).

Re claims 15,30 Duncan discloses cantilever deflection broadly interpreted as flexure plate wave device.

Re claim 16, Duncan discloses sensor readout circuit continuously outputs a frequency representing the resonance frequency of the sensor (Fig. 3).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 5-6, 9, 13-14, 19, 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Duncan (US 6,041,642) in view of Sauerland (US 3,840,804).

Re claim 9, Duncan discloses all of the claimed limitations as set forth above except circuit suitable for predetermined frequency range between 10 – 30 MHz.

Sauerland discloses circuit suitable for predetermined frequency of more than 200 MHz, which includes the range between 10 – 30 MHz.

Sauerland did not expressly disclose predetermined frequency is in the range 10 – 30 MHz.

[MPEP 2144.05 [R-1] Obviousness of Ranges: See MPEP § 2131.03 for case law pertaining to rejections based on the anticipation of ranges under 35 U.S.C. 102 and 35 U.S.C. 102/103. I. OVERLAP OF RANGES: In the case where the claimed ranges “overlap or lie inside ranges disclosed by the prior art” a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990)]

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Duncan by adding a sensor comprising a resonator having a predetermined frequency range as disclosed by Sauerland for accurately measuring frequency in the specified range.

Re claims 5-6, 13, 24-26 Duncan did not expressly disclose input voltage is offset 270^0 , and $0-360^0$ phase shift.

Sauerland discloses input voltage is offset 270^0 ($90 + n180^0$ where n is an integer) (column 3 lines 12-21).

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Duncan by adding 270^0 input voltage offset disclosed by Sauerland for obtaining a desired phase shift in the range $0-360^0$ phase shift.

Re claims 14,19 Duncan discloses all of the claimed limitations as set forth including bandwidth is proportional to Q/f_n but did not expressly disclose Q is calculated from the ratio of the offset of the voltage and the offset of the frequency.

Sauerland discloses Q_{eff} is calculated from the ratio of offset voltage and the offset of the frequency ($\Delta\theta/\Delta f$) (column 5 lines 25-35).

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Duncan by adding Q_{eff} calculated from the ratio of offset voltage to and the offset of the frequency disclosed by Sauerland to accurately calculate resonant frequency f_n (see Duncan column 1 lines 34-35).

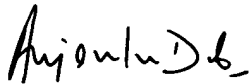
ACTION IS MADE FINAL

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Anjan K. Deb whose telephone number is 571-272-2228. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, N. Le, can be reached at (571) 272-2233.



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5/18/04

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